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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,085	08/31/2001	Masayuki Hirano	046124-5092	7669

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EXAMINER

WANG, GEORGE Y

ART UNIT PAPER NUMBER

2882

DATE MAILED: 08/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/943,085

Applicant(s)

HIRANO ET AL.

Examiner

George Y. Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claims 4 and 5 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 4 and 5 recite the broad recitation "x-ray imaging apparatus" and "x-ray inspection system," respectively, and the claims also recite "x-ray generating apparatus" which is the narrower statement of the range/limitation.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skillicorn et al. (U.S. Patent No. 5,077,771, from hereinafter "Skillicorn") in view of Yahata et al. (U.S. Patent No. 4,734,924, from hereinafter "Yahata").

Skillicorn discloses an X-ray generating apparatus having an X-ray tube (fig. 2, ref. 44) within a housing sealed into vacuum for generating an X-ray by focusing an electron emitted from a cathode (fig. 5, ref. 68) into an anode target (fig. 2, ref. 58) by way of a grid electrode (fig. 2 ref. 70) and a focusing electrode (fig. 2, ref. 72). The

apparatus also includes a grid voltage control for controlling a grid voltage applied to grid electrode (col. 4, lines 60-66), and pulse generator (fig. 2, ref. 10) which changes from an OFF state to an ON state and keeps the ON state for a predetermined period of time (col. 4, lines 60-66). In response a generated pulse, the grid voltage control applies a cutoff voltage to the grid electrode when pulse is in the OFF state so as to prevent electron emitted from the cathode from reaching the anode target and applies a grid operating voltage, by a cathode current detecting resistor (fig. 5, ref. 188) that detects a cathode current, adjusted such that the electron emitted from the cathode so as to bombard the anode target attains a predetermined amount of quantity when the pulse is in the ON state. The grid voltage control possesses a negative voltage generating section for generating a predetermined negative voltage (col. 10, lines 30-32), a pulse inverter (fig. 6a, ref. 232) for inputting and generating an inverted pulse in which the ON and OFF states of the inputted pulse are inverted, a switch (fig. 6a, ref. 26) for inputting the inverted pulse generated by the pulse inverter and outputting, when the inverted pulse is in the ON state, the predetermined negative voltage generated by the negative voltage generating section, a reference voltage generating section for generating a reference positive voltage (fig. 5, ref. 55), a second switch (fig. 6a, ref. 36) for inputting the pulse generated by the pulse generating means and outputting, when the pulse is in the ON state, the reference positive voltage (col. 10, lines 30-32) generated by the reference voltage generating section, an operational amplifier (fig. 5, ref. 260) having one input terminal for inputting a voltage generated by the cathode current detecting resistor and the other input terminal for inputting the predetermined

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negative voltage outputted from the switch and the reference positive voltage outputted from the second switch, and a grid voltage control circuit (abstract) for controlling, in response to an output from the operational amplifier, the grid voltage applied to the grid electrode .

Skillicorn also teaches an X-ray imaging apparatus (col. 3, lines 11-13; col. 17, lines 36-40) that generates receives the pulse generated by the pulse generating means and captures the X-ray transmission image when the pulse is in the ON state. Furthermore, the Skillicorn reference teaches an X-ray inspection system (col. 17, lines 49-59) possessing the aforementioned x-ray generator, such that when the pulse generator has a trigger signal outputting means for outputting a trigger signal (col. 13, lines 42-47) according to the detection of the object and where the imaging means receives the pulse outputted from the pulse generator and captures the X-ray transmission image when the pulse is in the ON state.

However, Skillicorn fails to specifically disclose an X-ray generating apparatus with a second grid electrode.

Yahata discloses an x-ray generator with switching elements having a first and second grid (fig. 3, ref. G1, G2) for voltage control.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated a second grid electrode for voltage control since one would be motivated to enhance the voltage amplification of the tube since the second grid electrode is biased to additional voltage (col. 4, lines 40-50). Furthermore, incorporating a second grid would protect the apparatus from abnormal current activity

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because of grounding and its affiliation to error-informing signals of a protection circuit (col. 3, ref. 41-60).

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 703-305-7242. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

gw  
August 21, 2002

*DK*  
2002/08/21  
SUPERVISOR  
RECEIVED